FIG. 1

● BLOCK DIAGRAM OF ATM TO FR / FR TO ATM (FORWARD, BACKWARD)

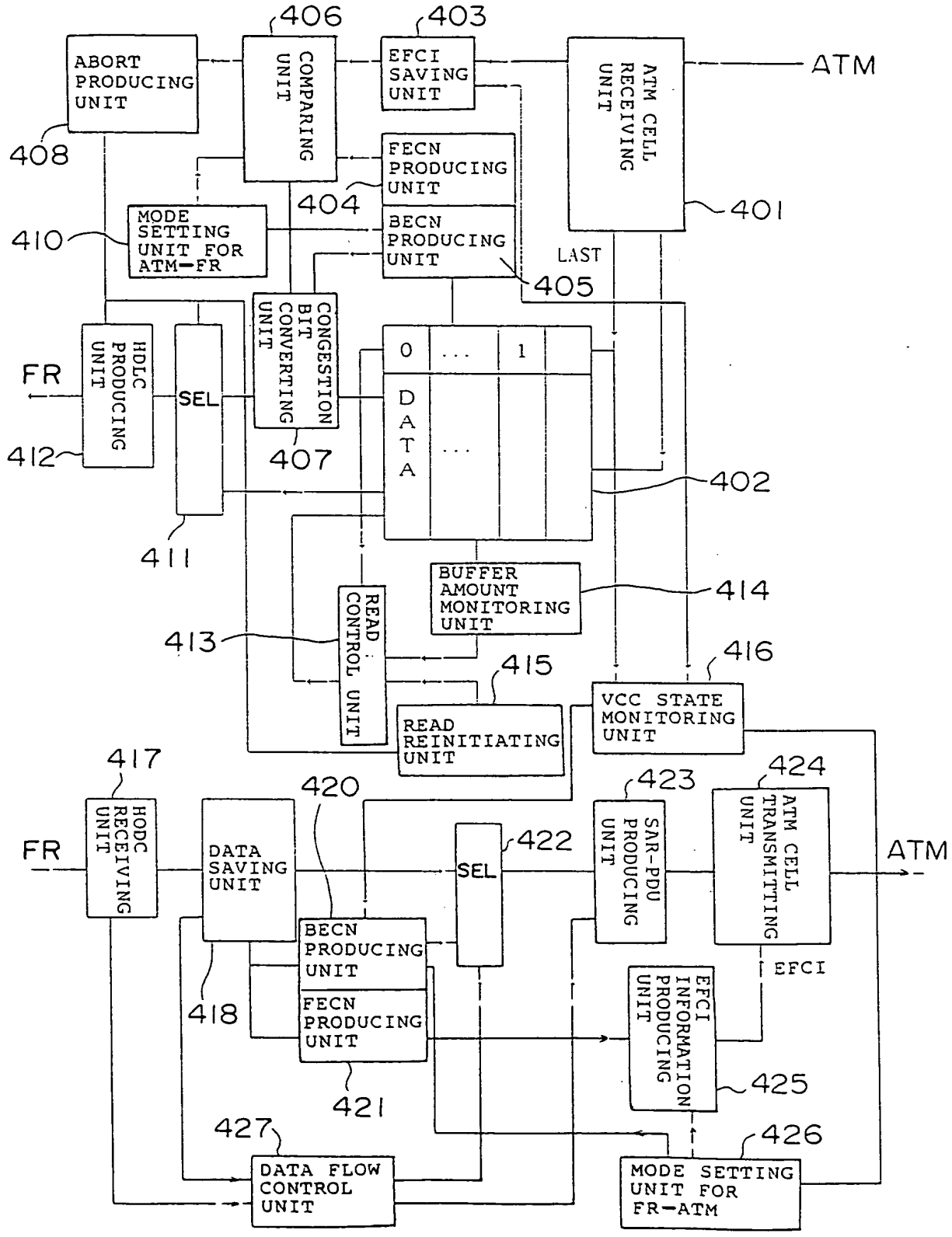

FIG. 2

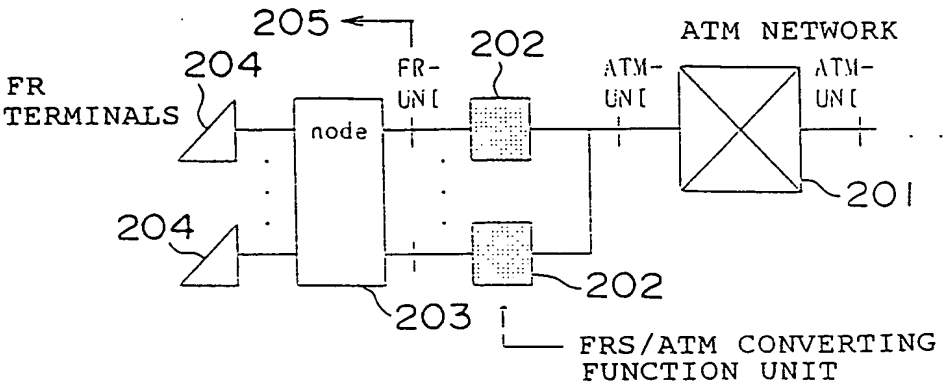
205
202
ATM NETWORK
204
FR-
UNI
ATM-
UNI
ATM-
UNI
FR
TERMINALS
node
201
204
202
203
FRS/ATM CONVERTING
FUNCTION UNIT

FIG. 3

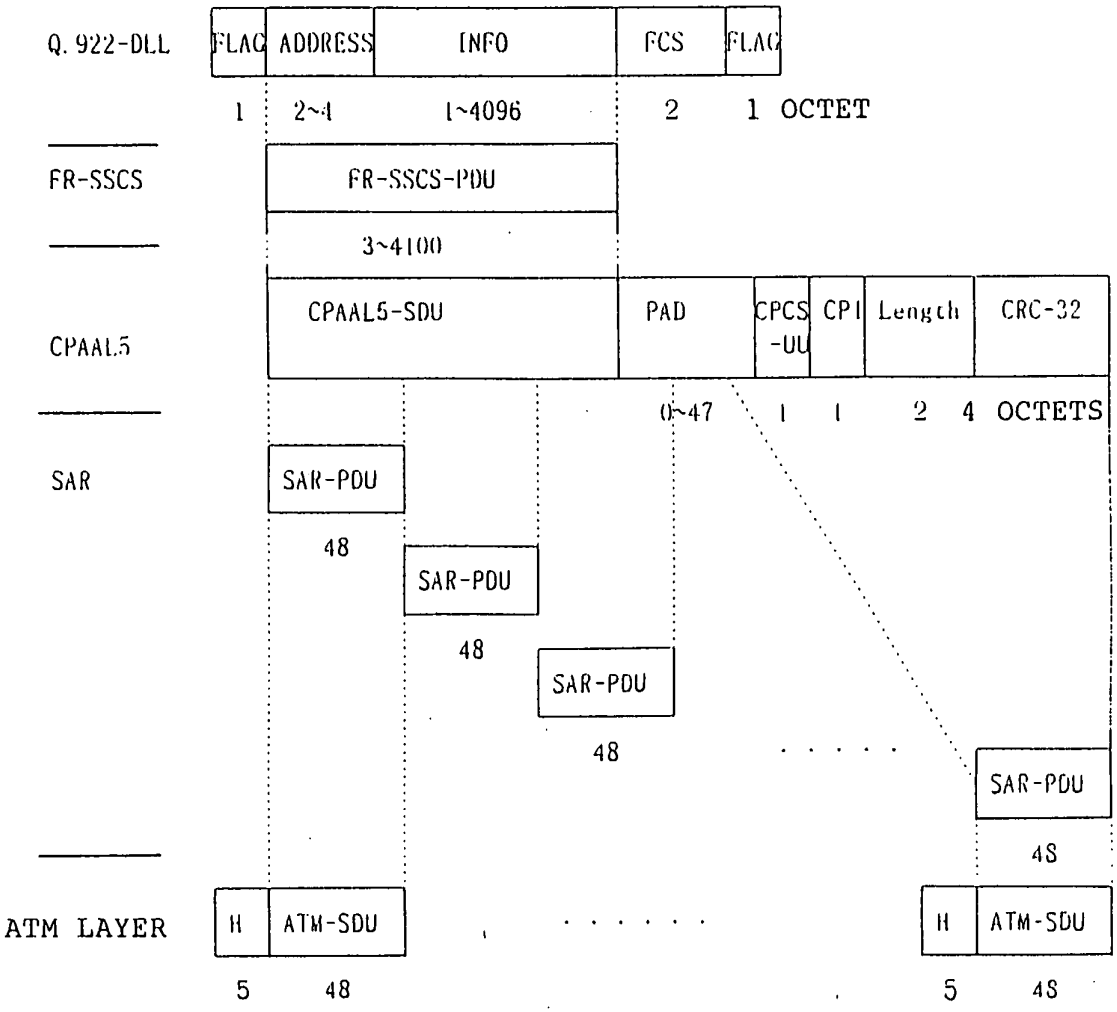
Q.922-DLL
FLAG
ADDRESS
INFO
FCS
FLAG
1
2~4
1~4096
2
1 OCTET
FR-SSCS
FR-SSCS-PDU
3~4100
CPAAL5
CPAAL5-SDU
PAD
CPCS-UU
CPI
Length
CRC-32
0~47
1
1
2
4 OCTETS
SAR
SAR-PDU
48
SAR-PDU
48
SAR-PDU
48
SAR-PDU
48
ATM LAYER
H
ATM-SDU
5
48
H
ATM-SDU
5
48

FIG. 4

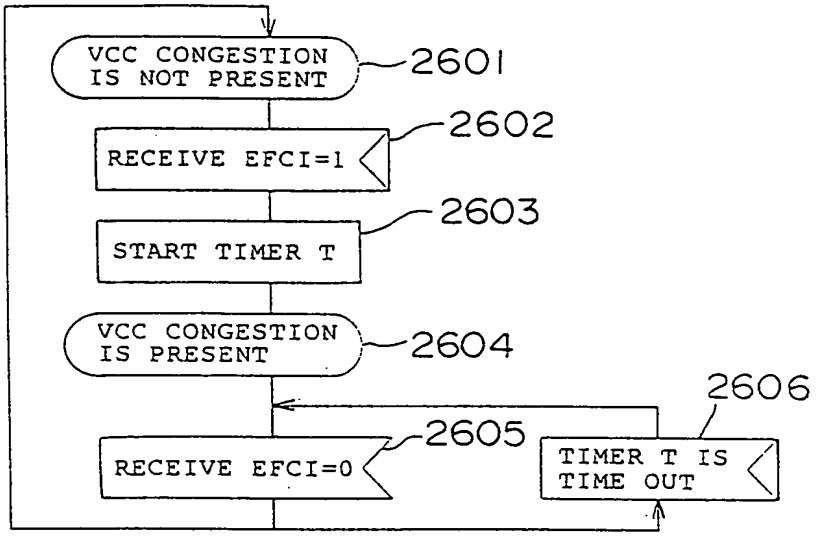
VCC CONGESTION IS NOT PRESENT
2601
RECEIVE EFCI=1
2602
START TIMER T
2603
VCC CONGESTION IS PRESENT
2604
2606
RECEIVE EFCI=0
2605
TIMER T IS TIME OUT

FIG. 5

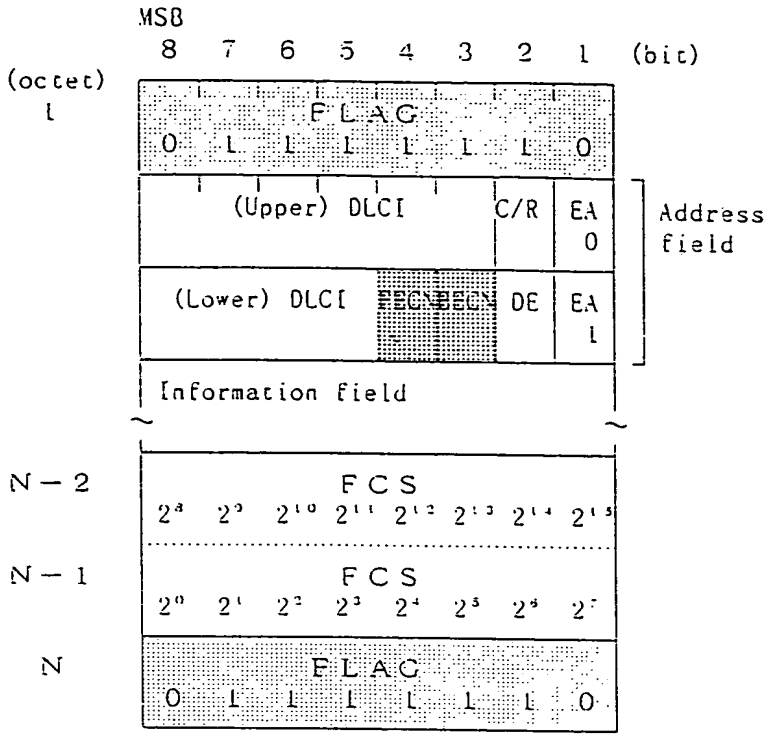
MSB
8 7 6 5 4 3 2 1 (bit)
(octet)
1
FLAG
0 1 1 1 1 1 1 0
(Upper) DLCI
C/R
EA 0
Address field
(Lower) DLCI
FECN
BECN
DE
EA 1
Information field
N − 2
FCS
N − 1
FCS
N
FLAG
0 1 1 1 1 1 1 0

FIG. 6

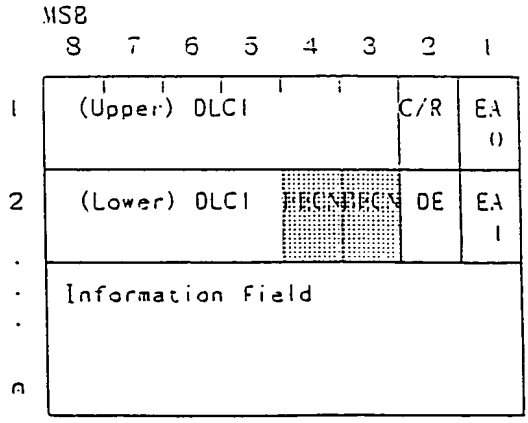
MSB
8 7 6 5 4 3 2 1
1
(Upper) DLCI
C/R
EA 0
2
(Lower) DLCI
FECN
BECN
DE
EA 1
Information field
n

FIG. 7

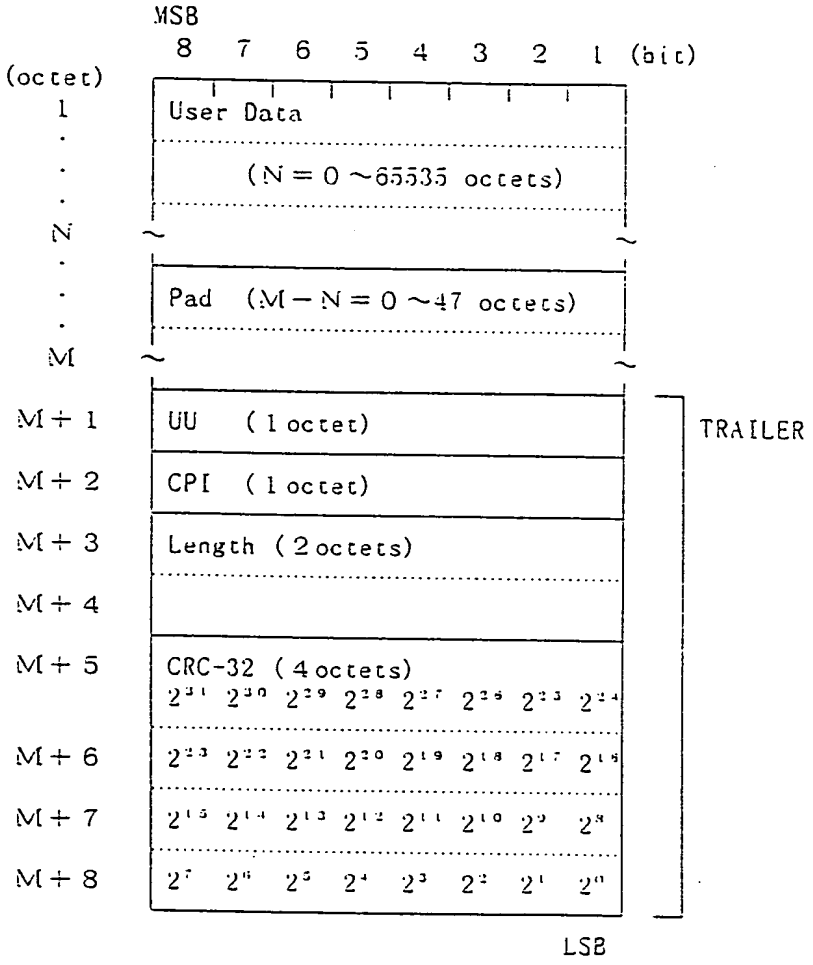
MSB
8 7 6 5 4 3 2 1 (bit)
(octet)
1
N
M
User Data
(N = 0 ~65535 octets)
Pad (M − N = 0 ~47 octets)
M + 1
M + 2
M + 3
M + 4
M + 5
M + 6
M + 7
M + 8
UU (1 octet)
CPI (1 octet)
Length (2 octets)
CRC-32 (4 octets)
TRAILER
LSB

FIG. 8

FIELD	OCTET	CONTENT
USER DATA	1-655350	USER DATA FIELD: IN THE CASE OF LENGTH FIELD VALUE ≥ 1, CPAAL5-5DU IS TRANSMITTED. IN THE CASE OF LENGTH FIELD VALUE = 0, FORWARD ABORT FORMATION FOR CAAL5-PDU IS APPLIED.
PAD	0-47	PAD FIELD:
UU	1	USER-USER FIELD:
CPI	1	COMMON PART INDICATOR FIELD:
LENGTH	2	LENGTH FIELD:
CRC-32	1	CRC-32 FIELD:

FIG. 9

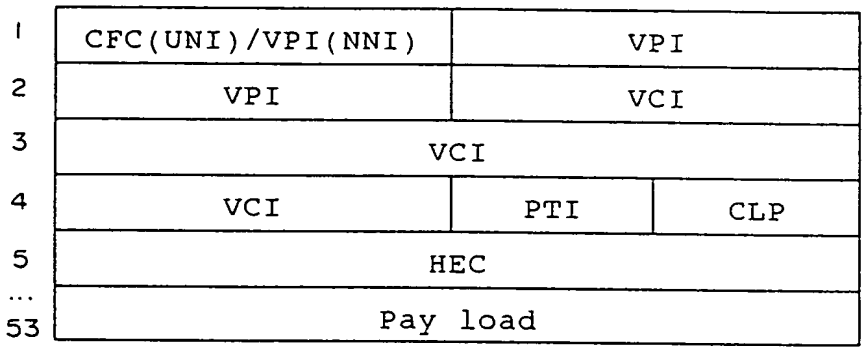
1
2
3
4
5
...
53
CFC(UNI)/VPI(NNI)
VPI
VPI
VCI
VCI
VCI
PTI
CLP
HEC
Pay load

FIG. 10

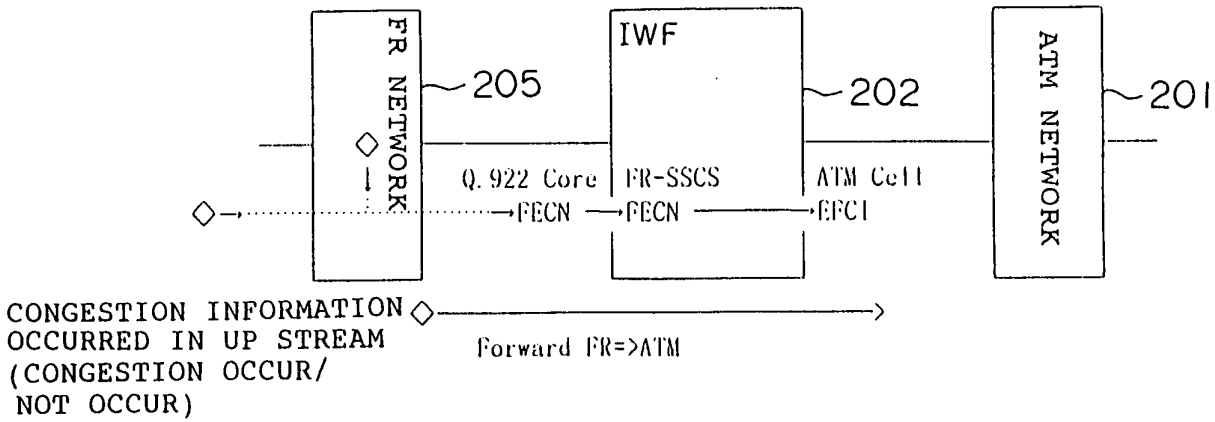
FR NETWORK
205
IWF
202
ATM NETWORK
201
Q.922 Core
FR-SSCS
ATM Cell
FECN
FECN
EFCI
CONGESTION INFORMATION
OCCURRED IN UP STREAM
(CONGESTION OCCUR/
NOT OCCUR)
Forward FR=>ATM

FIG. 11

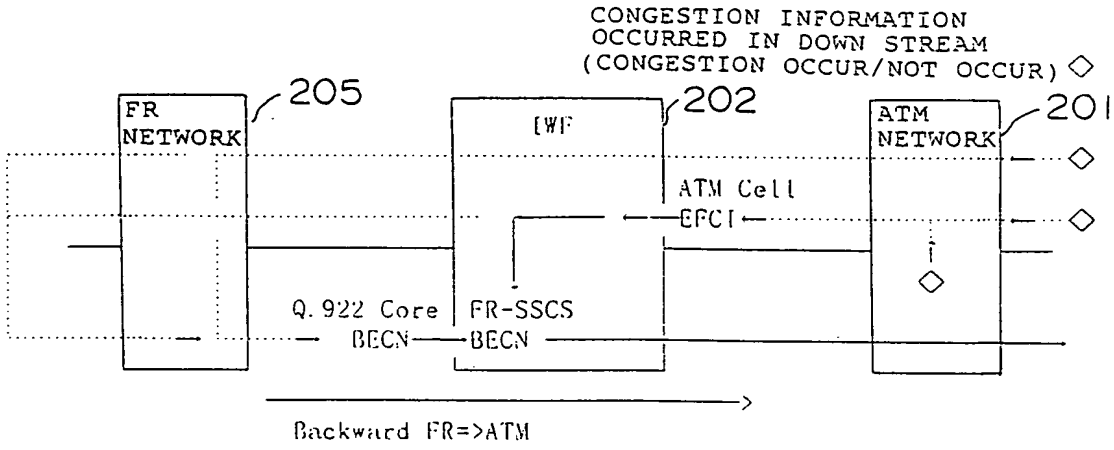
CONGESTION INFORMATION
OCCURRED IN DOWN STREAM
(CONGESTION OCCUR/NOT OCCUR)
FR
NETWORK
205
IWF
202
ATM
NETWORK
201
ATM Cell
EFCI
Q.922 Core
BECN
FR-SSCS
BECN
Backward FR=>ATM

FIG. 12

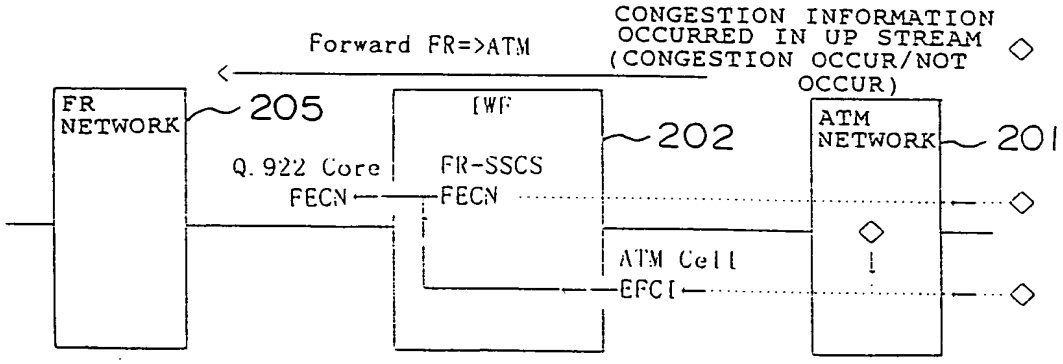
Forward FR=>ATM
CONGESTION INFORMATION
OCCURRED IN UP STREAM
(CONGESTION OCCUR/NOT
OCCUR)
FR
NETWORK
205
IWF
202
ATM
NETWORK
201
Q.922 Core
FECN
FR-SSCS
FECN
ATM Cell
EFCI

FIG. 13

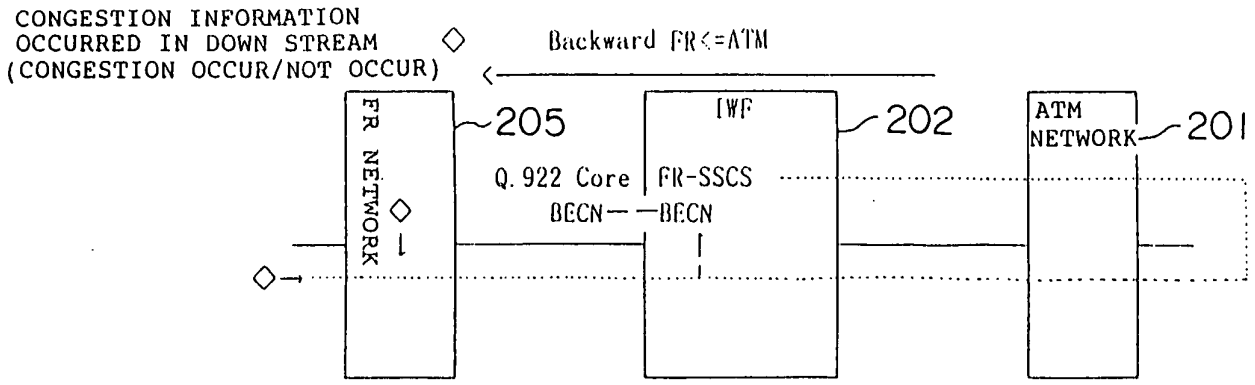
CONGESTION INFORMATION
OCCURRED IN DOWN STREAM
(CONGESTION OCCUR/NOT OCCUR)
Backward FR<=ATM
FR NETWORK
205
IWF
202
ATM
NETWORK
201
Q.922 Core
FR-SSCS
BECN
BECN

FIG. 14

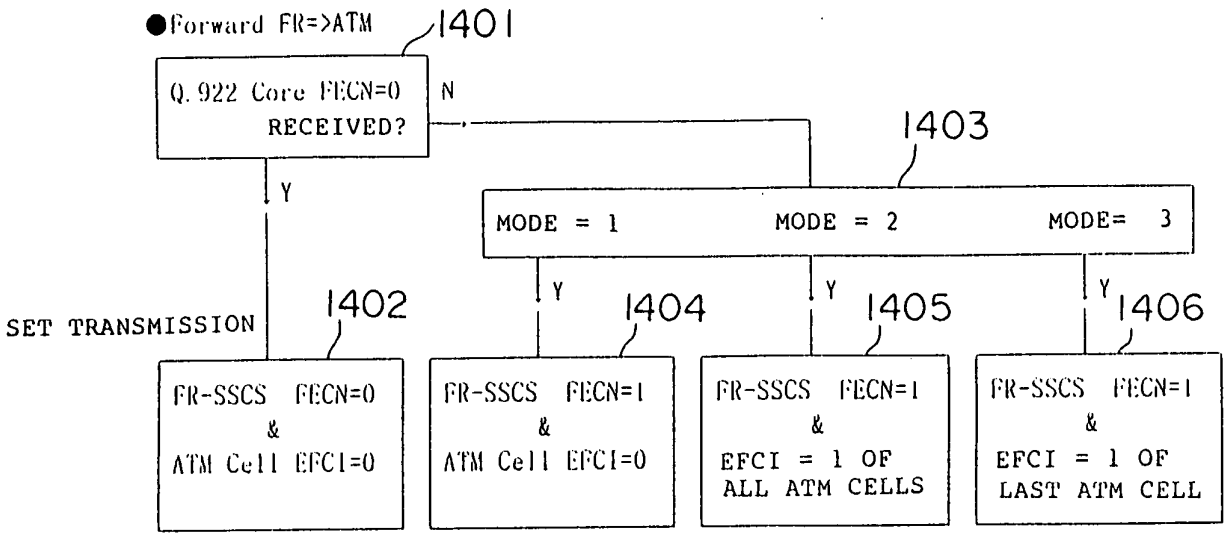
●Forward FR=>ATM
1401
Q.922 Core FECN=0 RECEIVED?
N
Y
1403
MODE = 1
MODE = 2
MODE= 3
Y
Y
Y
SET TRANSMISSION
1402
1404
1405
1406
FR-SSCS FECN=0 & ATM Cell EFCI=0
FR-SSCS FECN=1 & ATM Cell EFCI=0
FR-SSCS FECN=1 & EFCI = 1 OF ALL ATM CELLS
FR-SSCS FECN=1 & EFCI = 1 OF LAST ATM CELL

FIG. 15

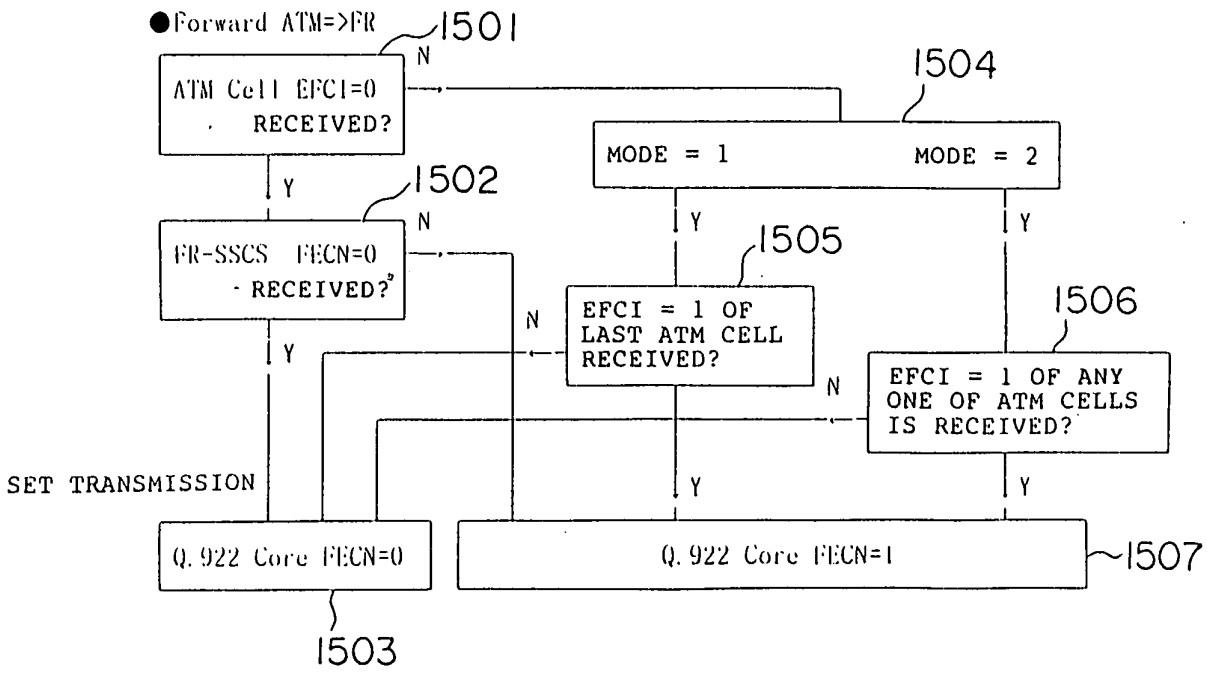
●Forward ATM=>FR
1501
ATM Cell EFCI=0 RECEIVED?
N
Y
1502
FR-SSCS FECN=0 RECEIVED?
N
Y
1504
MODE = 1
MODE = 2
Y
Y
1505
EFCI = 1 OF LAST ATM CELL RECEIVED?
N
1506
EFCI = 1 OF ANY ONE OF ATM CELLS IS RECEIVED?
N
SET TRANSMISSION
Y
Y
Q.922 Core FECN=0
Q.922 Core FECN=1
1507
1503

FIG. 16

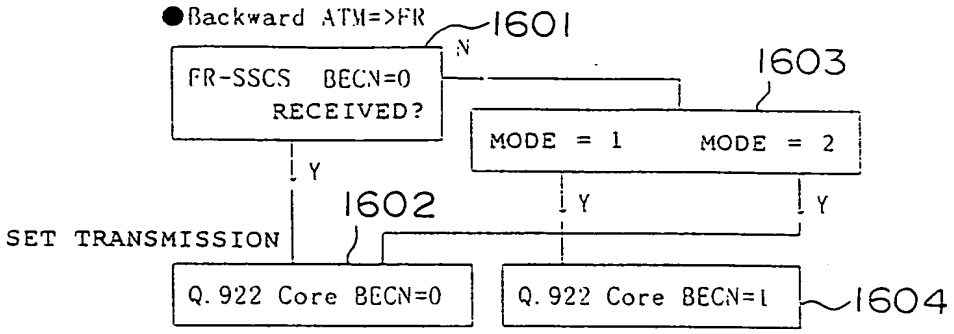
Backward ATM=>FR
1601
FR-SSCS BECN=0 RECEIVED?
N
1603
MODE = 1
MODE = 2
Y
Y
Y
1602
SET TRANSMISSION
Q.922 Core BECN=0
Q.922 Core BECN=1
1604

FIG. 17

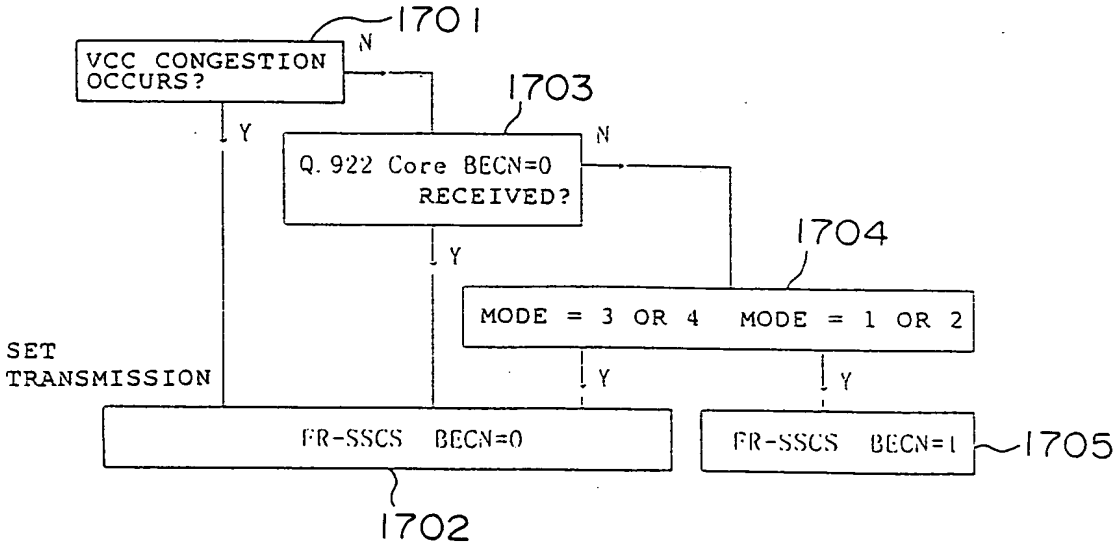
1701
VCC CONGESTION OCCURS?
N
Y
1703
Q.922 Core BECN=0 RECEIVED?
N
Y
1704
MODE = 3 OR 4
MODE = 1 OR 2
Y
Y
SET TRANSMISSION
FR-SSCS BECN=0
FR-SSCS BECN=1
1705
1702

FIG. 18

	CONTENTS	REMARKS
MODE 1	FECN of Q. 922-DLL frame is not mapped to EFCI of the ATM cell belonging to that frame. That is, EFCI field of ATM cell is constantly set to "no congestion occurs." However, if no congestion occurs in a forward direction, FECN field of FRSSCS-PDU is constantly set to "no congestion occurs." Or otherwise, FECN field of FRSSCS-PDU is set to "congestion occurs." That is, EFCI field of Q. 922-DLL frame is copied to FECN field of FR-SSCS-PDU without any modification.	
MODE 2 (NEW)	FECN of Q. 922-DLL frame is mapped to EFCI of all ATM cells belonging to that frame.	
MODE 3 (NEW)	FECN of Q. 922-DLL frame is not mapped to EFCI of the last ATM cell belonging to that frame.	

FIG. 19

	RECEPTION	TRANSMISSION		REMARAKS
	Q.922 FECN	FR-SSCS FECN	ATM EFCI	
MODE 1	0 1	0 1	0 O	
MODE 2 (NEW)	0 1	0 1	0 1 ※1	※1 : SET TO ALL ATM CELLS
MODE 3 (NEW)	0 1	0 1	0 1 ※2	※2 : SET TO FINAL ATM CELL

FIG. 20

	CONTENT	REMARKS
MODE 1	If EFCI field is set to "congestion occurs" at the last ATM cell of the segment frame to be received, or if FECN field of FR-SSCS-PDU to be received is set to "congestion occurs," FECN of Q. 922-DLL frame is set to "congestion occurs."	
MODE 2	If EFCI field is set to "congestion occurs" at any of the ATM cell of segment frame to be received, or if FECN field of FR-SSCS-PDU to be received is set to "congestion occurs," FECN of Q. 922-DLL frame is set to "congestion occurs."	

FIG. 21

	ATM EFCI	FR-SSCS FECN	Q.922 FECN	REMARKS
MODE 1	0	0	0	*1: If EFCi has been set at last final ATM cell
	0	1	1	
	1 *1	0	1	
	1 *1	1	1	
MODE 2 (NEW)	0	0	0	*2: If EFCi has been set at any of the ATM cell
	0	1	1	
	1 *2	0	1	
	1 *2	1	1	

FIG. 22

	CONTENT	REMARKS
MODE 1	BECON FIELD OF FIR-SSCS-PDU IS DUPLICATED TO BECN FIELD OF Q.922 CORE FRAME WITHOUT ANY CHANGE.	
MODE 2 (NEW)	BECN OF Q.922-DLL FRAME IS ALWAYS SET TO "0".	

FIG. 23

	RECEPTION	TRANSMISSION	REMARKS
	FR-SSCS BECN	Q.922 BECN	
MODE 1	1 0	1 0	
MODE 2 (NEW)	1 0	0 0	

FIG. 24

	CONTENT	REMARKS
MODE 1	1. If BECN of Q. 922-DLL frame to be delivered from FR to ATM directions has been set, or 2. if the value of EFCI in the last segment frame ATM cell to be received from ATM to FR directions used in the bi-directional connection is used for a VCC congestion state transition and the VCC congestion state is of "congestion occurs," FR-SSCS BECN = 1 is set.	
MODE 2 (NEW)	1. If BECN of Q. 922-DLL frame to be delivered from FR to ATM directions has been set, or 2. if the value of EFCI in any of the segment frame ATM cell to be received from ATM to FR directions used in the bi-directional connection is used for a VCC congestion state transition and the VCC congestion state is of "congestion occurs," FR-SSCS BECN = 1 is set.	
MODE 3 (NEW)	1. BECN of Q. 922-DLL frame to be received is ignored. Therefore, 2. Only if the condition is similar to that of MODE 1 (2), FR-SSCS BECN = 1 is set.	
MODE 4 (NEW)	1. BECN of Q. 922-DLL frame to be received is ignored. Therefore, 2. Only if the condition is similar to that of MODE 2 (2), FR-SSCS BECN = 1 is set.	

FIG. 25

	VCC CONGESTION STATE	RECEPTION	TRANSMISSION	
		Q.922 BECN	FR-SSCS BECN	
MODE 1	NO CONGESTION OCCURS	0 1	0 1	※1 : WHEN EFCI IS SET TO FINAL ATM CELL
	CONGESTION OCCURS	0 1	1 1	
MODE 2 (NEW)	NO CONGESTION OCCURS	0 1	0 1	※2 : WHEN EFCI IS SET TO ANY ONE OF ATM CELLS
	CONGESTION OCCURS	0 1	1 1	
MODE 3 (NEW)	NO CONGESTION OCCURS	0 1	0 0	※1 : WHEN EFCI IS SET TO FINAL ATM CELL
	CONGESTION OCCURS	0 1	1 1	
MODE 4 (NEW)	NO CONGESTION OCCURS	0 1	0 0	※2 : WHEN EFCI IS SET TO ANY ONE OF ATM CELLS
	CONGESTION OCCURS	0 1	1 1	